A.D. 1856 . . . . . N° 2942.

# SPECIFICATION

OF

FREDERICK WILLIAM ANDERTON
AND
JOSEPH BEANLAND.

## FURNACES.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:
PUBLISHED AT THE GREAT SEAL PATENT OFFICE,
25, SOUTHAMPTON BUILDINGS, HOLBORN.
Price 8d. 1857.

# A.D. 1856 . . . . . N° 2942.

## Furnaces.

**LETTERS PATENT** to Frederick William Anderton, of Bradford, in the County of York, Worsted Spinner, and Joseph Beanland, of the same Place, Engineer, for the Invention of "IMPROVEMENTS IN APPARATUS OR MEANS IN CONNECTION WITH FURNACES TO FACILITATE THE CONSUMPTION OF SMOKE."

Sealed the 24th April 1857, and dated the 11th December 1856.

**PROVISIONAL SPECIFICATION** left by the said Frederick William Anderton and Joseph Beanland at the Office of the Commissioners of Patents, with their Petition, on the 11th December 1856.

We, FREDERICK WILLIAM ANDERTON, of Bradford, in the County of York, Worsted Spinner, and JOSEPH BEANLAND, of the same Place, Engineer, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN APPARATUS OR MEANS IN CONNECTION WITH FURNACES TO FACILITATE THE CONSUMPTION OF SMOKE," to be as follows:—

The improvements relate to a combination of means for the admission of air to the fire-place, and consist, when using hollow fire bars, in conducting atmospheric air thereto through bell or funnel-shaped or other suitable conductors to the inner ends of such bars, in order that such air may traverse the bars to the front ends of them, where there are openings to admit of its escape into the fire-place in front of the fuel therein, and there is a valve or flap which is operated upon by the opening and closing of the fire door, so that

such valve or flap may, by covering, close these openings when the door is open, to prevent their being stopped up by the fresh fuel at the time of supply, and then, by uncovering, open them again so soon as the door is closed; and when these passages are thus open, the supply of air which has become heated in its passage through the hollow bars takes place. In place of only one valve or flap, there may be several of them, and such valves or flaps, by turning on hinge joints, also serve, according to the inclination given them, to deflect the air on to the burning fuel (or the flame therefrom) at any angle desired, and prevent its passing direct upon and thereby injuring the boiler.

---

**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said Frederick William Anderton and Joseph Beanland in the Great Seal Patent Office on the 11th June 1857.

**TO ALL TO WHOM THESE PRESENTS SHALL COME**, we, FREDERICK WILLIAM ANDERTON, of Bradford, in the County of York, Worsted Spinner, and JOSEPH BEANLAND, of the same Place, Engineer, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Eleventh day of December, in the year of our Lord One thousand eight hundred and fifty-six, in the twentieth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto us, the said Frederick William Anderton and Joseph Beanland, Her special licence that we, the said Frederick William Anderton and Joseph Beanland, our executors, administrators, and assigns, or such others as we, the said Frederick William Anderton and Joseph Beanland, our executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN APPARATUS OR MEANS IN CONNECTION WITH FURNACES TO FACILITATE THE CONSUMPTION OF SMOKE," upon the condition (amongst others) that we, the said Frederick William Anderton and Joseph Beanland, our executors or administrators, by an instrument in writing under our or their hands and seals, or under the hand and seal of one of us or them, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that we, the said Frederick William Anderton and Joseph Beanland, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

The improvements relate to a combination of means for the admission of air to the fire-place, and consists, when using hollow fire bars, in conducting atmospheric air thereto through bell or funnel-shaped or other suitable conductors to the inner ends of such bars, in order that such air may traverse the bars to the front ends of them, where there are openings to admit of its escape into the fire-place in front of the fuel therein. And there is a valve or flap which is operated upon by the opening and closing of the fire door, so that such valve or flap may, by covering, close these openings when the door is open, to prevent their being stopped up by the fresh fuel at the time of supply, and then, by uncovering, open them again so soon as the door is closed, and when these passages are thus open, the supply of air which has become heated in its passage through the hollow bars takes place.

In place of only one valve or flap, there may be several of them, and such valves or flaps, by turning on hinge joints, also serve, according to the inclination given them, to deflect the air on to the burning fuel (or the flame therefrom) at any angle desired, and prevent its passing direct upon and thereby injuring the boiler.

But that the nature of our said Invention, and the means we adopt in carrying the same into effect, may be more fully understood, we will proceed to describe the Drawing annexed.

## Description of the Drawing.

Figure 1 shews a section, and Figure 2 a plan view of a boiler with furnaces arranged according to our improvements. The plan shows the boiler to have two fire-places A, B; and in the one (A), the bars and other parts are shown in their places complete, whilst in the other fire-place (B), the bars and some other of the parts are removed, in order that parts otherwise covered may be more fully seen. *a*, *a*, are the hollow furnace bars which receive air into them by the funnels or bell-shaped conductors *b*; but other suitable conductors may be employed to conduct the atmospheric air to the hollow bars.

The atmospheric air having traversed the bars to the front ends of them, escapes by the openings *c* to the fuel in the fire-place, and there is a valve or flap *d* at this point, which turns upon a hinge joint *e*, to deflect the heated air as it passes out from the open ends of the fire bars upon the fuel in the fire-place. This valve or flap *d* is acted upon to open or close it by the closing or

opening of the fire door *f*, in the following manner:—Upon the lower side of the furnace door is affixed a wheel or pulley $f^1$, which, as the door is closed, comes upon the upper part of the rod *g* to depress it, and the lower end of the rod *g* is by a pin joint connected to the one end of the lever *h*, which turns upon the axis of motion $h^1$, and at its other end is connected to a projection from the valve or flap *d*, as shown. Consequently, when the furnace door is opened, and the pressure of the wheel $f^1$ is removed from the upper end of the rod *g*, the flap or valve *d* is allowed to fall, thereby closing the opening to the hollow bars to prevent accumulation of fuel within the flaps; at the same time any fuel or dust which may accumulate therein is allowed to escape by the passages *i* in the plate $i^1$ under the plate *d*.

Having thus described the nature of our said Invention, we would have it understood that we do not confine ourselves to the precise details of the parts as herein shewn and described, as these may be varied, so long as the adaptation or combination of parts, acting in manner and for the purpose substantially as explained, be retained.

In witness whereof, we, the said Frederic William Anderton and Joseph Beanland, have hereunto set our hands and seals, this Ninth day of June, in the year of our Lord One thousand eight hundred and fifty-seven.

FREDERIC WILLIAM ANDERTON. (L.S.)
JOSEPH BEANLAND. (L.S.)

Witness,
ARTHUR BENTLEY.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1857.

FIG. 1.

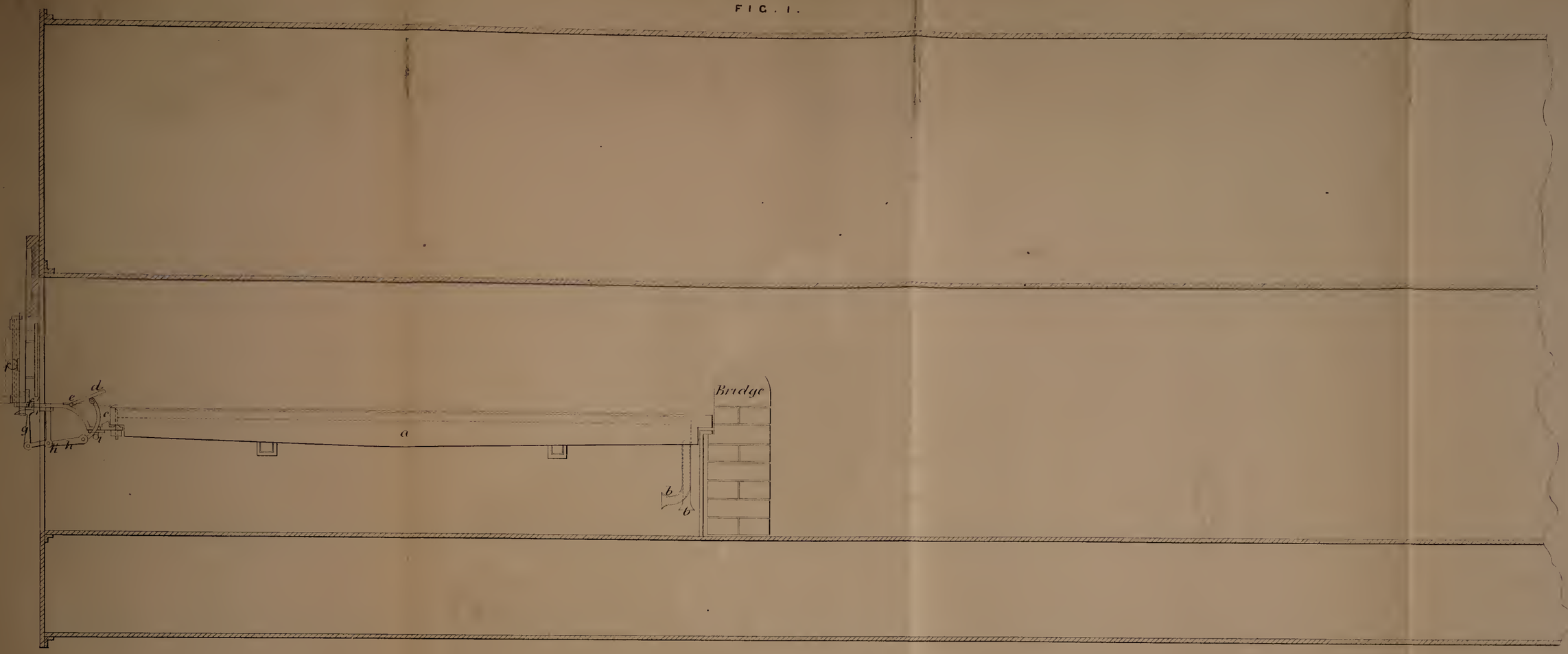
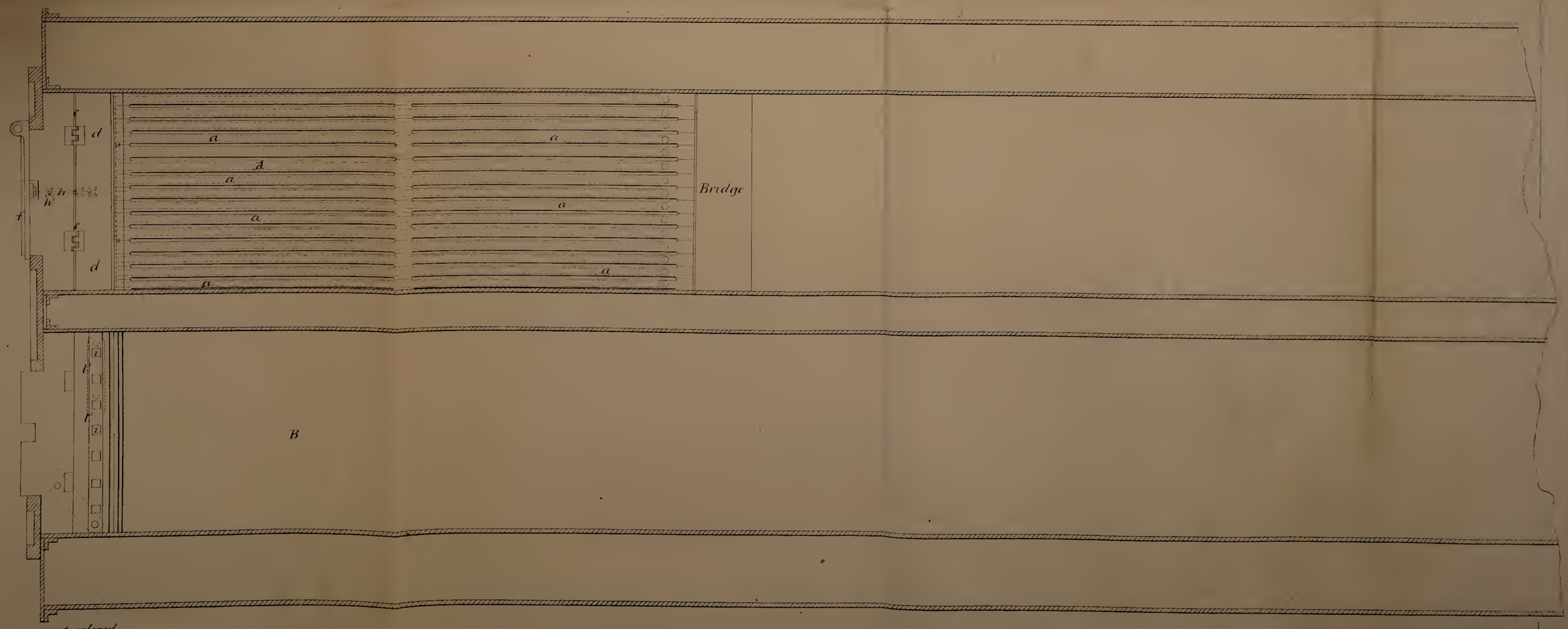



FIG. 2.




*The filled drawing is not colored.*

Drawn on Stone by Maley & Son.

London: Printed by George Edward Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1857.